

SELECTIVE JOINT DEMODULATION SYSTEMS AND METHODS FOR RECEIVING A SIGNAL IN THE PRESENCE OF NOISE AND INTERFERENCE

ABSTRACT OF THE DISCLOSURE

A signal is received in the presence of noise and interference by demodulating the signal when a relationship between the signal and the noise and the interference meets a criterion, and by jointly demodulating the signal when the relationship between the signal and the noise and the interference does not meet the criterion. Moreover, the signal may be demodulated if a relationship between the noise and the interference meets a second criterion and may be jointly demodulated if the relationship between the noise and the interference does not meet the second criterion. More specifically, demodulation may be performed when the signal-to-noise-and-interference ratio exceeds a first threshold and joint demodulation may be performed when the signal-to-noise-and-interference ratio is less than the first threshold. Moreover, the signal may be jointly demodulated if the interference-to-noise ratio exceeds a second threshold, and the signal may be demodulated if the interference-to-noise ratio is less than the second threshold. Thus, if the desired signal power is high relative to noise and interference, joint demodulation may be skipped and demodulation may be performed. Moreover, if the desired signal power is not large compared to interference-and-noise, joint demodulation may be used only when the interference power is high relative to the noise power. Finally, an interfering signal's synchronization word may be found in the received signal, and the power of the interfering signal relative to the noise power may be determined from the located interfering signal synchronization word, to thereby determine the interference-to-noise ratio. Moreover, the interfering signal's synchronization word that is detected can provide improved estimation of the interfering signal's channel estimate, which can be estimated in terms of the interfering signal's medium response compared to the composite channel response.